

## PATENT SPECIFICATION

423,828



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## PROVISIONAL SPECIFICATION

## Improvements in the Treatment of Paper

I, LOUIS TAYLOR, of 3, Broughton Lane, City of Manchester, a British Subject, do hereby declare the nature of this invention to be as follows:—

- 5 This invention relates to a process for imparting to paper the pliable or draping properties of a textile fabric whereby the paper can be readily caused to cover any curved or irregular surface.
- 10 The process consists in breaking up the surfaces of the paper with innumerable holes of very fine diameter which penetrate into or through the body of the paper.
- In carrying out the invention the holes
- 15 are formed by a roller having a large number of spikes or pins around its periphery, the roller being passed backwards and forwards over the surface of the paper or the paper being passed backwards and

forwards under the roller or between a pair of rollers or continuously through a series of such rollers.

The invention can be applied to paper of all kinds when pliable or draping properties are desired and it is particularly applicable to the treatment of absorbent paper as such paper when so treated can be used for many purposes for which a textile material has hitherto been used.

Among such uses are sterilised surgical dressings and swabs whether medicated or not, dental swabs, sanitary towels, pocket handkerchiefs and analogous purposes.

Dated this 30th day of January, 1934.

J. OWDEN O'BRIEN & SON,  
Late W. P. Thompson & Co. of  
Manchester,  
Patent Agents.

## COMPLETE SPECIFICATION

## Improvements in the Treatment of Paper

I, LOUIS TAYLOR, of 3, Broughton Lane, City of Manchester, a British Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

- This invention relates to improvements in the treatment of paper to render it more pliable and to increase its absorptive properties by means of perforation.
- 45 Many suggestions have already been made for improving the pliability and increasing the absorptive properties of paper for example:—

1. It has been proposed to increase the absorption properties of paper by subjecting the paper stock repeatedly to an indenting action by means of a series of reciprocating stamps co-acting with dies or of a series of rollers, the said stamps or rollers being formed with projections
- 55 alternating with recesses, the pitch of the projections in succeeding stamps or rollers gradually diminishing.

2. It has been proposed to produce a sanitary paper for pads or bandages, for medical or surgical purposes or as dressing for cuts, wounds or bruises from a felted paper manufactured from material composed wholly of wool or cotton, or of

sponge or other absorbent material the felted paper being perforated with holes arranged at from  $\frac{1}{2}$  inch to 1 inch apart and of a diameter of about  $\frac{1}{16}$  of an inch and then indurated with a disinfectant.

3. It has been proposed to treat sheets of sulphite cellulose paper made of wood pulp with one or more rows of fine points or needles placed close together at regular intervals, the points or needles passing right through the sheet so as to form punctures therein resembling the interstices of woven fabrics to allow of circulation of air through the sheet and so permit it to be used in the manufacture of clothing.

4. It has been proposed to produce a blotting paper that will not take a facsimile of the written matter blotted on its surface by pressing a sheet or sheets thereof with a plate or roller studded with needle points to cause the paper to be perforated or indented so that the paper is pierced or cut through and a number of projections left upon its surface.

5. It has been proposed to improve the absorption properties of blotting paper and blotting pads by forming there-through perforations, such perforations being of relatively large size spaced at relatively large distances apart, and of regular pattern or design.

[Price 1/1]

The present invention differs from the above referred to previously proposed treatment of paper and blotting paper in that punctures formed in the paper are not of a regular pattern or design, penetrate the surface of the paper, are of very small size and are as close together as possible.

The present invention thus consists in treating paper to render it more pliable and to increase its absorptive properties by breaking up the surface of the paper with innumerable very fine punctures formed in the surface as close together as possible without any regular design or pattern to break up the fibres at the surface thereof.

The invention will be described with reference to the accompanying drawings in which:—

Fig. 1. is a perspective view of a part of a length of paper before treatment.

Fig. 2. is a perspective view of a part of a length of paper after treatment.

Fig. 3. is a diagrammatic view illustrating one method of producing the fine punctures in the surface of the paper.

Fig. 4. is a diagrammatic view illustrating another method of producing the fine punctures in the surface of the paper.

Figs. 5 and 6 are a front view and side view respectively of one of the rollers B shown in Fig. 3 or Fig. 4.

Figs. 7, 8, 9 and 10 are diagrammatic views illustrating further methods of producing the fine punctures in the surface of the paper.

The innumerable fine punctures *a* which break up the surface or surfaces of the paper A may be formed by a series of fine pins or needle points *b* set closely around the periphery of a roller or rollers such as B shown in Figs. 5 and 6 or in a reciprocating plate or plates such as B1 shown in Fig. 10.

In treating individual sheets or short lengths of paper the fine perforations *a* may be formed in the surface by a single roller B having fine pins or needle points around its periphery the roller being passed backwards and forwards over the surface of the paper until the surface is completely broken up by the innumerable fine punctures caused by the pins *b* and any pattern or regularity of design is eliminated.

In treating long lengths of paper or the paper as it comes off a paper making machine the fine punctures *a* may be formed in the surface by a series of rollers B as shown in Fig. 3 the paper passes under (or over) the rollers B each of which co-operates with a series of felt or similarly covered rollers C. With such arrangement of rollers B only one surface

of the paper would be punctured by the pins *b* of the rollers B and to puncture the other surface it would be necessary to pass the paper through a further series of rollers reversed in relation to the first series or to reverse the paper and then pass it in the opposite direction through the rollers. Alternatively as shown in Fig. 4 the rollers B and the felt covered rollers C may be arranged in pairs so that the first roller B acts on the top surface of the paper, the second on the under surface, the third on the top surface and so on.

In the arrangement shown in Fig. 7 the paper A is passed in a zig-zag path between two vertical rows of rollers B and C in which the rollers B having pins *b* alternate with the felt covered rollers C.

In the arrangement shown in Figs. 8 and 9 the rollers B with the fine pins *b* are arranged between the peripheries of felt covered rollers C1 of larger diameter and travelling felt covered bands C2, the paper being traversed through the device either as shown in Fig. 8 or Fig. 9. Alternatively the pins could be arranged on the large rollers and on the bands and the small rollers between them be covered with felt.

In cases in which the pins *b* are carried by rollers of relatively large diameter, they could be affixed thereto by winding thereon lengths of material similar to card clothing having pins projecting from its surface.

In the several Figs. the disposition of the rollers B is such that the fine pins *b* completely break up the surface of the paper by innumerable fine punctures therein as close together as possible without any pattern or regularity of design in the punctures.

Instead of the paper being punctured by pins mounted on rollers B it may be punctured by pins *b* mounted on a reciprocating plate B1 as shown in Fig. 10. In this arrangement the paper A is travelled with an intermittent movement over the surface of a felt or similarly covered plate D and at each stationary period of the paper the plate B1 is brought downward to cause the pins *b* to puncture the surface of the paper. Any desired amount of forward movement may be imparted to the paper at each movement thereof according to the number of pins on the reciprocating plate and the number of punctures necessary to break up the surface of the paper by innumerable punctures therein and without producing any pattern or regularity of design thereon. To puncture the opposite surface of the paper the latter may be reversed or a series of reciprocating plates operating in opposite directions may be employed.

After the paper has been treated as hereinbefore described it may be finished by being subjected to the rubbing action of an abrasive material and/or with polished rollers to glaze or lay the surface.

The invention can be applied to paper of various kinds when it is desired to impart pliable or draping properties thereto and/or increase its absorption properties and it is particularly applicable for the treatment of absorbent paper such as blotting paper as such paper when so treated can be used for many purposes for which a textile material has hitherto been used.

Among such uses are sterilized surgical dressings and swabs whether medicated or not, dental swabs, sanitary towels, pocket handkerchiefs and analogous purposes.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A process for treating paper to render it more pliable and to increase its absorptive properties, consisting in break-

ing up the surface with innumerable very fine punctures formed in the surface as close together as possible without any regular design or pattern, to break up the fibres at the surface thereof.

2. The process substantially as described and illustrated in the accompanying drawings for treating paper to render it more pliable and increase its absorptive properties.

3. Paper when treated according to the process claimed in claim 1 or 2.

4. Absorbent paper such as blotting paper when treated according to the process claimed in claim 1 or 2.

5. Surgical dressings and swabs, dental swabs, sanitary towels, pocket handkerchiefs and analogous articles made from paper which has been treated according to the process claimed in claim 1 or 2.

Dated this 8th day of May, 1934.

J. OWDEN O'BRIEN & SON,  
Late W. P. Thompson & Co. of  
Manchester,  
Patent Agents.

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[This Drawing is a reproduction of the Original on a reduced scale.]

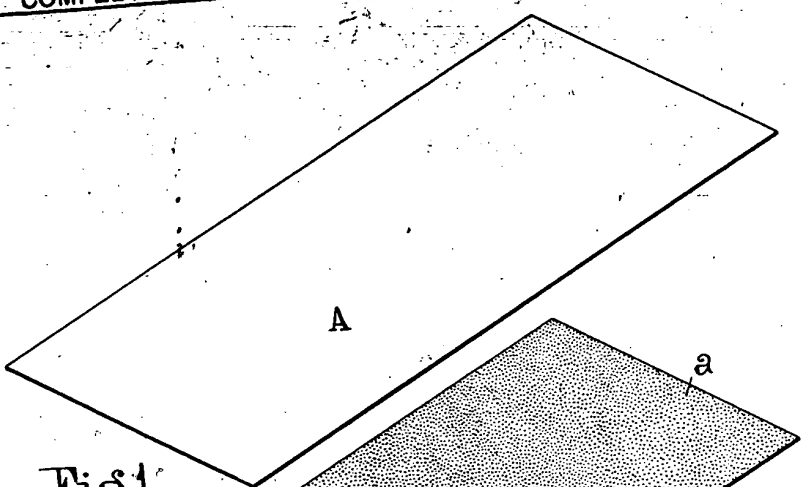


Fig. 1

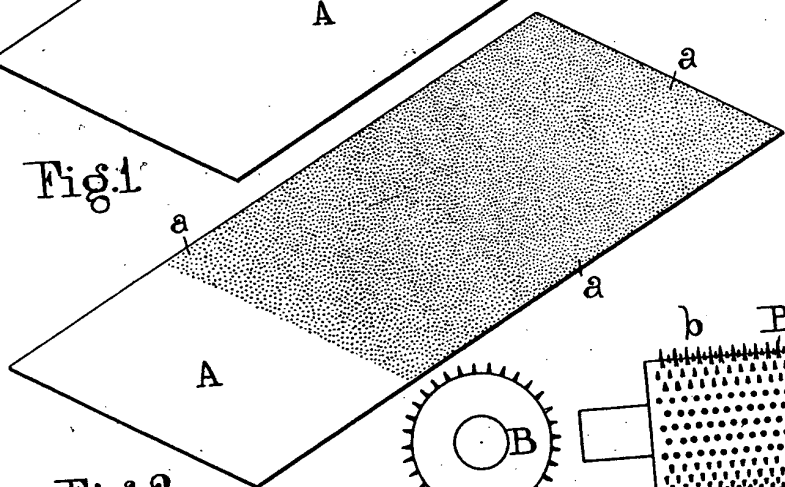


Fig. 2

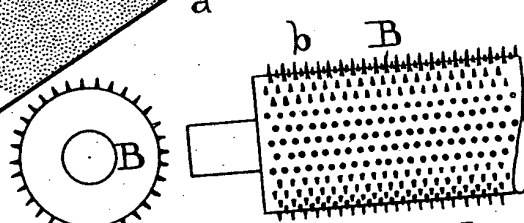


Fig. 5

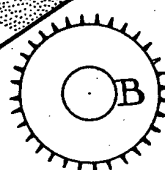


Fig. 6

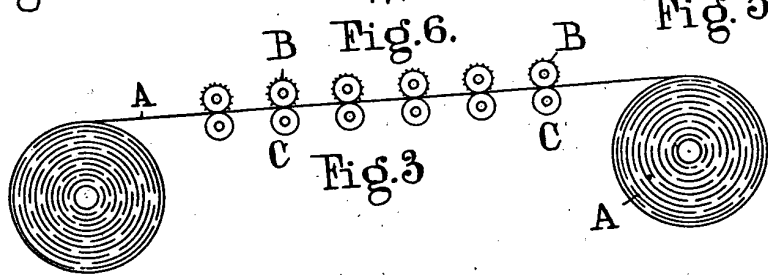


Fig. 3

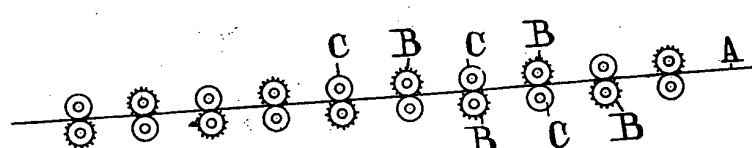


Fig. 4

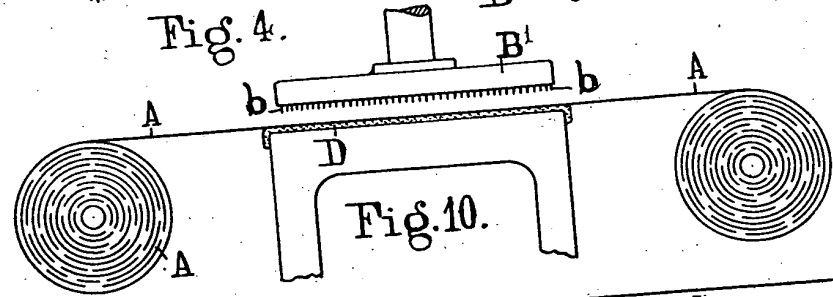


Fig. 10

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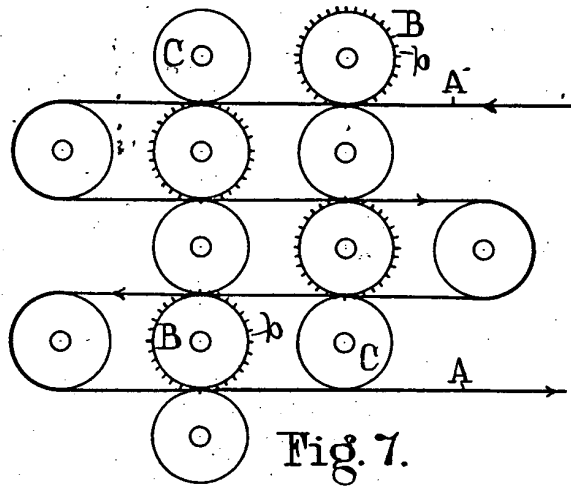


Fig. 7.

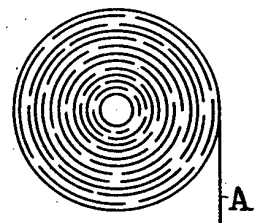


Fig. 8.

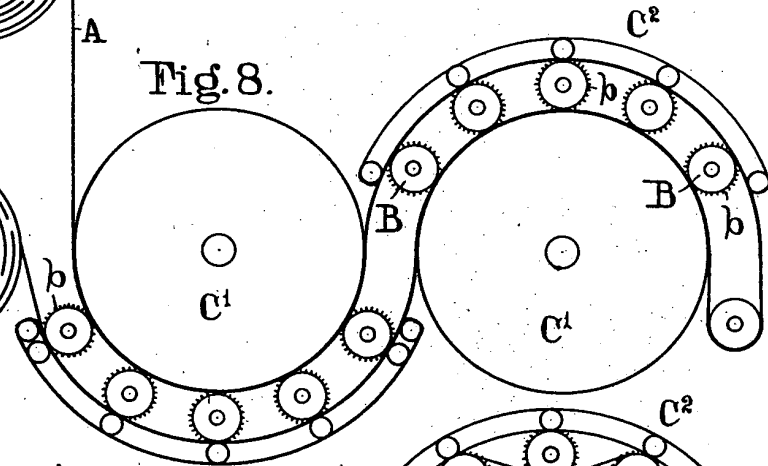


Fig. 9.

